

PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Bavykin, et al.  
Application: METHOD FOR LABELING DNA AND RNA  
Serial No.: 10/057,753  
Filing Date: January 23, 2002  
Art Unit: 1637  
Examiner: Kim, Young J  
Case No.: 0003/00377

AMENDMENT CLAIMS

Please amend claim 3, 10, 12, and 13 as follows:

1. (original): A method for labeling nucleic acids, the method comprising:
  - a) contacting nucleic acid molecules with hydrogen peroxide and a redoxactive coordination complex for a time and at concentrations sufficient to produce free-aldehyde moieties on the molecules;
  - b) reacting the aldehyde moieties with amine to produce a condensation product; and
  - c) labeling the condensation product.
2. (original): The method as recited in claim 1 wherein the step of labeling the condensation product further comprises:
  - a) reducing the condensation product; and
  - b) contacting the reduced condensation product with a chromophore.
3. (Currently Amended): The method as recited in claim 1 wherein the [nuclease is a coordination complex is selected from the group consisting of 1,10-phenanthroline-CuII, or bleomycin-Fe(III), or EDTA-Fe, or ascorbic acid-Cu, or methylene-blue-Cu, metallophorphyrin, or combinations thereof.
4. (original): The method as recited in claim 1 wherein the amine is a primary amine.

5. (original): The method as recited in claim 1 wherein the amine is ethylene diamine or hydrazine or aminated biotin.

6. (original): The method as recited in claim 1 wherein the contacting step occurs in an anaerobic environment.

7. (original): The method as recited in claim 1 wherein the step of labeling the condensation product further comprises reducing the condensation product and cross-linking the reduced condensation product with a label in one reaction step.

8. (original): The method as recited in claim 1 wherein the step of contacting the nucleic acid molecules with redox-active coordination complex includes contacting the nucleic acid with a denaturing agent.

9. (original): A method for modifying nucleic acids, the method comprising:

- a) contacting free radicals with the nucleic acids to produce free nucleic acid bases and aldehyde forms of ribose and deoxyribose;
- b) contacting the aldehyde forms with an amine to produce a condensation product;
- c) reducing the condensation product; and
- d) labeling the reduced condensation product.

10. (Currently Amended): The method recited in claim 9 wherein the step of ~~producing free radicals~~ are produced by ~~comprises~~ reacting hydrogen peroxide with chemical nucleases.

11. (original): The method as recited in claim 10 wherein the chemical nucleases are coordination complexes selected from the group consisting of 1,10-phenanthro-line-Cu, bleomycin-Fe(III), EDTA-Fe, ascorbic acid-Cu, methylene-blue-Cu, metallophorphyrin, or combinations thereof.

12. (Currently Amended): The method recited in claim 9 wherein steps c and d ~~d and e~~ occur simultaneously.

13. (Currently Amended): The method recited in claim 9 wherein steps d ~~d and e~~ occurs in anaerobic conditions.

14. (original): The method as recited in claim 9 wherein the nucleic acid is double stranded and wherein the step of contacting the free radicals with the nucleic acids is preceded by the addition of a double-strand weakening agent.

15. (original): The method as recited in claim 14 wherein the double-strand weakening agent is a denaturing agent selected from the group consisting of carbonic acid, urea, ethyl carbonate, cyanamide, urethane, and combinations thereof.

16. (original): The method as recited in claim 9 wherein the nucleic acid is modified at temperatures below the boiling point of water.

17. (original): The method as recited in claim 9 wherein the nucleic acid modification occurs at between 0 °C and 95 °C.

18. (original): The method as recited in claim 9 wherein the free radicals are contacted with the nucleic acids in an anaerobic atmosphere.